

Dartmoor

Dartmoor is a huge dominating presence over much of the county. It is distinctly different from the rest of Devon, owing to a unique combination of topography, geology, climate, land-use and location and this is reflected in a fascinating flora full of stories and surprises. Dartmoor also has a crucial role in providing the people of Devon with water, accounts for most of the County's stored carbon, has a thriving agricultural and tourist industry and gives great pleasure and inspiration to millions of visitors and local people every year.

So what makes it special? It is the largest upland in southern England, covering an area of 954 sq. km (368 sq. miles) rising from the surrounding lowlands (around 30 m – 98 ft.) to just over 621 m (2,039 ft.) at High Willhays. The massif of Dartmoor (some 65%) is made of granite, intruded into the surrounding sedimentary rocks – limestones, shales and sandstones – over 295 million years ago. Today, the highest plateaux of Dartmoor form a wild open moorscape punctuated with tors and boulder fields. Newtakes abut the open land and small fields enclosed by stonewalls stretch up to the moorland edge. Downslope the farmland becomes more sheltered and intimate with ancient hedges, small copses, flower-rich meadows and sunken lanes. Cutting through this are major Devon rivers which rise on the high plateaux before plunging through steeply wooded gorges to the sea, providing water to Torbay and Plymouth on the way. The nooks and crannies of the Dartmoor fringes are equally good for plant hunters.

Dartmoor has a special climate – three coats are often recommended if you are journeying from the fringes to the top of Dartmoor – and you might need all or none of them at any time of year! It is cold and wet in winter, warms up quickly in spring in the valleys, and is increasingly subject to extreme weather at any time. This diversity of climate can be traced in the vegetation – for example, northerly species such as Crowberry *Empetrum nigrum* grow on the blanket bog (recorded as long ago as 1897) whilst Bastard Balm *Melittis melissophyllum*, a species of central and southern Europe, grows in roadsides and woods on the fringes of the National Park. Pale Butterwort *Pinguicula lusitanica*, found in many valley mires, has a 'Lusitanian' distribution being confined to the Atlantic areas of western Europe. These biogeographical influences can also be traced in lower plants, for which the damp unpolluted air of Dartmoor is particularly favourable. Sub-arctic lichens such as *Umbilicaria torrefacta* may be found on moorland boulders a few hundred feet above woodland trees draped with *Usnea articulata*, now virtually confined to Brittany and Southwest Europe.

Dartmoor has been moulded by people since the Bronze Age (as they have been moulded by Dartmoor) and the past and present land use has contributed significantly to its special qualities; it is very much a 'cultural landscape'. For plants as well as people this has provided both challenges and opportunities. Today extensive, 'traditional' farming systems including commoning still survive and are thriving so there has been less disturbance, notably ploughing and use of chemicals, than elsewhere in Devon. Conifer trees grow very well in the wet winters and have been planted in large and small plantations. These have replaced moorland but themselves provide habitats. Dartmoor's minerals, stone and clay are highly prized and are still being extracted, providing old and new clay workings, spoil heaps, quarries and outcrops; and reservoirs and leats have been created for water supply. Tourism is now highly significant to the local economy; and recreation and enjoyment are now known to be crucial for health and wellbeing so there are increasing opportunities for all to appreciate and help look after Dartmoor's flora.

Dartmoor's ecological richness has been recognised by a number of international and national designations. Dartmoor is of international importance for its blanket bogs, upland heaths, upland oakwoods, and cave



Belted Galloway cattle at Emsworthy Mire.

systems and of at least national importance for its valley mires, Rhôs pasture and grass moor. An area amounting to over 25% of the Park has been designated as Sites of Special Scientific Interest (spread across 40 large and small sites), with most of this also being a Special Area of Conservation (SAC) under the European Habitats Directive. And of course, Dartmoor is one of the UK's most famous National Parks, having being declared in 1951.

In short, the natural and human influences on Dartmoor have combined to produce a diverse and unique flora where both experienced and would-be botanists can spend many happy days or years! Access is excellent with large areas of open country and an extensive network of well-maintained footpaths.

Moorland

Moorland encompasses a number of habitats: blanket bog on the highest, most poorly drained areas; upland heath on steeper slopes around the blanket bog; grass moor; valley mire; lowland heath; and tors and rocky outcrops.

Blanket bog covers the highest parts of Dartmoor. The 8,500 ha of Dartmoor's blanket bog is particularly important and is here at its most southerly limit in the northern hemisphere. Growing on thick peat (sometimes up to 7 m deep), the vegetation community is characterised by Purple Moor-grass *Molinia caerulea*, Deergrass *Trichophorum germanicum*, Hare's-tail Cottongrass *Eriophorum vaginatum* and Common Cottongrass *E. angustifolium*, with Round-leaved Sundew *Drosera rotundifolia*, Bog Asphodel *Narthecium ossifragum* and bog mosses *Sphagnum* spp. (most commonly *S. capillifolium* and *S. papillosum*). Heather *Calluna vulgaris* and Cross-leaved Heath *Erica tetralix* grow in drier areas within the blanket bog, typically on hummocks. Interesting species include Crowberry *Empetrum nigrum* (a few locations near Cranmere Pool, recorded from Dartmoor since 1879) and Cowberry *Vaccinium vitis-idaea*. In very wet areas a few small colonies of Bog Orchid *Hammarbya paludosa* can be found in some years.

Areas of outstanding botanical interest

Below the blanket bog on the better drained soils, upland heathland is dominated by Heather *Calluna vulgaris* growing with Western Gorse *Ulex gallii*, a right royal purple and gold spectacle in late summer. Cross-leaved Heath *Erica tetralix* grows with Heather on the wetter soils whilst Bell Heather *Erica cinerea* is commoner on drier or stony soils. Gorse *Ulex europaeus* is often found on lower slopes particularly where there has been some past disturbance. Bilberry *Vaccinium myrtillus* is common especially on the southern slopes of the open moor, often forming dominant stands. Baskets of bilberries are still gathered here. Grasses present include Purple Moor-grass *Molinia caerulea* in the wetter areas but, where it is drier, Heath-grass *Danthonia decumbens*, Sweet Vernal-grass *Anthoxanthum odoratum* and Pill Sedge *Carex pilulifera* are common. Bracken *Pteridium aquilinum* is ubiquitous wherever the soils are deep and dry enough, sometimes mixed with heathland species and sometimes forming dense stands. Amongst the lower growing heathland plants, a number of smaller herbs can be found. These include Tormentil *Potentilla erecta*, Heath Milkwort *Polygala serpyllifolia* and Lousewort *Pedicularis sylvatica*. More unusual plants of Dartmoor's upland heathland include Vigur's Eyebright *Euphrasia vigursii* (the main world population, recorded by William Vigur on Roborough Down in 1906 and pronounced new to the British Isles), Chamomile *Chamaemelum nobile*, Irish Lady's-tresses *Spiranthes romanoffiana* (on the edge of a valley mire and now not seen for some years) and Stag's Horn Clubmoss *Lycopodium clavatum*.

Grass moor is often said to be a derivative of upland heath which has been heavily burnt and grazed. Notwithstanding this, many of Dartmoor's grass moors are long established and are valuable for a good range of fungi, particularly waxcaps. Typical grasses include Common Bent *Agrostis capillaris*, Bristle Bent *A. curtisii*, Sheep's-fescue *Festuca ovina*, Sweet Vernal-grass *Anthoxanthum odoratum*, Heath-grass *Danthonia decumbens*, Pill Sedge *Carex pilulifera* and Green-ribbed Sedge *C. binervis*. On less acidic soils around the fringes of Dartmoor, Wild Thyme *Thymus polytrichus* and various Eyebrights *Euphrasia* spp. occur and there are records for Field Gentian *Gentianella campestris*. In some places, carpets of Bluebell *Hyacinthoides non-scripta* provide stunning spring displays, disappearing later in the summer under a canopy of bracken.

Valley mires occur wherever drainage is impeded on the open moor. Classically there are big 'basin' mires at around the 400 m contour but smaller mires and flushes can be found all over the open moor where they provide rich hunting grounds for botanists. Here the common species are Purple Moor-grass *Molinia caerulea*, *E. angustifolium*, *E. vaginatum*, Star Sedge *Carex echinata*, *N. ossifragum*, *D. rotundifolia*, Bogbean *Menyanthes trifoliata*, Marsh St John's-wort *Hypericum elodes*, Bottle Sedge *Carex rostrata* and much bog moss *Sphagnum* spp. Pale Butterwort *Pinguicula lusitanica*, Ivy-Leaved Bellflower *Wahlenbergia hederacea* and Bog Pimpernel *Anagallis tenella* are reasonably common and more unusual species include White Beak-sedge *Rhynchospora alba* (often flowering in white sheets) and Oblong-leaved Sundew *Drosera intermedia* and, in just one location, Great Sundew *D. anglica*. Stands of fragrant Bog-myrtle *Myrica gale* can be found occasionally as at Lee Moor, Yarner Wood and Cawsand Hill. Large-flowered Butterwort *Pinguicula grandiflora* was introduced from Ireland in the 1980s and now thrives in a few places. Famous mires include Fox Tor Mire (the 'Grimpen Mire' of Sir Arthur Conan Doyle's *The Hound of the Baskervilles*), Raybarrow Pool and Whitemoor Marsh. In addition, there is a small (8 ha) raised bog at Tor Royal which is not on open access land.

The lowland heaths of the Southwest Dartmoor Downs have already been well described above. Lowland heath can also be found at Trendlebere Down and some of the outlying commons of eastern Dartmoor. Here *Erica cinerea* is often the most common heather, growing with *Calluna vulgaris*, *P. aquilinum* and *U. gallii*. These heaths are particularly important for their bird and butterfly communities and have some rich small flushes with typical valley mire species.

Tors and their associated rocky outcrops are unique to granite landscapes and are characteristic of Dartmoor. Their sheltered, sheep-free crannies provide habitats for a number of interesting species and are always worth exploring. In particular a number of ferns can be found often growing deep within a crevice. Beech Fern *Phegopteris connectilis*, both species of Filmy-fern *Hymenophyllum tunbrigense* and *H. wilsonii*, Hay-scented Buckler-fern *Dryopteris aemula* and a range of more common species such as Broad Buckler-fern *D. dilatata*, Narrow Buckler-fern *D. carthusiana*, Polypody *Polypodium vulgare* and Hard Fern *Blechnum spicant* grow here. Aspect and moisture are both important for these plants, the rocks dry out quickly and are very exposed. Fir Clubmoss *Huperzia selago* can be found on the northern faces of bigger tors.

Further downslope some of the rocky outcrops of the metamorphic aureole are of interest. Toadflax-leaved St John's-wort *Hypericum linariifolium* is abundant where it occurs. It has been recorded from nine tetrads in the Teign Gorge with two outliers at Hennock and Cleft Rock. Forked Spleenwort *Asplenium septentrionale* can still be found in one remote location near Hennock where it was first reported by Rev. William Moyle Rogers in 1878. Lanceolate Spleenwort *Asplenium obovatum* occurs all around the aureole with some substantial populations. Most are on shady walls but a few are on native outcrops as at Hennock. Other species of the metamorphic aureole include Little-Robin *Geranium purpureum* which can be very common in the Dunsford area and further south. Parsley Fern *Cryptogramma crispera*, first seen in 1968, survives on old mortar in a wall near Fox Tor Mire, where it was probably introduced.

Woodland

Around 12% (11,000 ha) of Dartmoor consists of woodland, two-thirds of this being broad-leaved and one-third being conifer plantation.

About one-third of broad-leaved woodland on Dartmoor is ancient woodland and it is internationally important for conservation. Much of this is within the South Dartmoor Woodland Special Area of Conservation, and includes the Dart Valley, Bovey Valley and Teign Valley Woods, covering over 2,000 ha. In the steep wooded valleys which particularly characterise the eastern side of Dartmoor, a legacy of human use for charcoal and tan bark from medieval times up until the Second World War has resulted in tall Sessile Oak *Quercus petraea* coppice on gnarled stools with a ground flora dominated by mosses and lichens. Other associated tree species include Rowan *Sorbus aucuparia*, Hazel *Corylus avellana*, Ash *Fraxinus excelsior* and Birch (mostly *Betula pubescens*). On richer soils Small-leaved Lime *Tilia cordata* stands can be found (in the Dart Valley) and Wild Service-tree *Sorbus torminalis* is scattered through oakwoods in the Dart and Teign Valleys. In some woods there are spectacular spring displays of Bluebell *Hyacinthoides non-scripta*, Wild Daffodil *Narcissus*



Scanniclift Wood in spring.

Areas of outstanding botanical interest

pseudonarcissus, Ramsons *Allium ursinum* and Wood Anemone *Anemone nemorosa*, with Common Cow-wheat *Melampyrum pratense* on drier soils and an abundance of ferns including Tunbridge Filmy-fern *Hymenophyllum tunbridgense*, Lady-fern *Athyrium filix-femina* and Lemon-scented Fern *Oreopteris limbosperma*.

Wet woodland is often dominated by Alder *Alnus glutinosa*, Goat Willow *Salix caprea* and Grey Willow *S. cinerea* with a rich ground flora which includes *Sphagnum* mosses, Opposite-leaved Golden-saxifrage *Chrysosplenium oppositifolium*, Marsh-marigold *Caltha palustris* and many fern species including Royal Fern *Osmunda regalis*.

Three small upland copses of Pedunculate Oak *Quercus robur*, Wistman's Wood, Piles Copse and Black Tor Copse, have interested naturalists since they were first described by Tansley in 1939. They are similar in size, appearance and aspect and all have a mystical atmosphere with luxuriant mosses and lichens draping thick gnarled branches and huge granite boulders. Their origins are unknown although many theories exist. Wistman's Wood and Black Tor Copse are now National Nature Reserves.

The large conifer plantations of Dartmoor are mostly planted with Sitka Spruce *Picea sitchensis* and Norway Spruce *P. abies*. However, moorland flora survives in many places and there is a variety of deciduous woodland and scrub within the plantations. In Soussons Forest, there is a stand of Dorset Heath *Erica ciliaris* which has survived surprisingly well here since being planted in the early 20th century. There are also nearly 800 ha of conifer plantations on ancient woodland sites which still retain remnants of ancient woodland flora.

Farmland

Farmland covers by far the largest portion of the National Park and is a haven for wildlife. On Dartmoor, tucked amongst the more productive land, there are still traditional haymeadows, wet pastures that have not been drained and hedges and stone walls, which provide habitats for a host of higher and lower plants.

Dartmoor is nationally important for its haymeadows, which are one of its summer glories. About 20 meadows are scattered across the park with a concentration in the Postbridge area. Amongst a diversity of grasses, the colourful display includes Oxeye Daisy *Leucanthemum vulgare*, Common Knapweed *Centaurea nigra*, Cat's-ear *Hypochaeris radicata* and Yellow Rattle *Rhinanthus minor*. More notable plants are Greater Butterfly-orchid *Platanthera chlorantha*, Southern Marsh-orchid *Dactylorhiza praetermissa*, Heath Spotted-orchid *D. maculata* subsp. *ericetorum*, Moonwort *Botrychium lunaria*, Great Burnet *Sanguisorba officinalis* and Frog Orchid *Coeloglossum viride* (now only known in Devon from one Dartmoor haymeadow). Other dry grassy meadows are sometimes very rich in plant species, particularly where they are on base rich soils around the metamorphic aureole, often on very steep slopes. Here are found species such as Deptford Pink *Dianthus armeria*, *Thymus polytrichus*, Green-winged Orchid *Anacamptis morio*, Hoary Cinquefoil *Potentilla argentea* and Slender Bird's-foot-trefoil *Lotus angustissimus*.

Rhôs pasture is largely found in valleys but can also occur on poorly drained plateaux, especially in the northeast of the park. These wet meadows cover over 1,000 ha and represent about 20% of the English resource of this internationally rare habitat. The flora is usually dominated by Purple Moor-grass *Molinia caerulea* and rushes *Juncus* spp. but a rich diversity of plants includes Devil's-bit Scabious *Succisa pratensis*, Meadow Thistle *Cirsium dissectum*, Petty Whin *Genista anglica*, Ragged-robin *Silene flos-cuculi*, Heath Spotted-orchid *Dactylorhiza maculata*, *D. praetermissa*, Cranberry *Vaccinium oxycoccos* (very rarely) and Saw-wort *Serratula tinctoria*. These areas scrub up very fast in the steamy sheltered climate and grazing is essential to maintain their ecological value. The National Park Authority supports a herd of Dartmoor ponies which rotate around the sites doing an excellent job of controlling scrub and coarser species, and cattle grazing is part funded by agri-environment schemes.

Open water

The rivers, streams and leats (man-made water courses) of Dartmoor pass through many habitats and their flora reflects this. However there are a few additional species of note. Pink Purslane *Claytonia sibirica* is a small



West Dart River near Dunnabridge.

pretty pink flowered introduction which has rapidly colonised stream sides since it was first recorded at Haytor Vale in 1923. Less welcome are the tall stands of Himalayan Balsam *Impatiens glandulifera* which have spread along many rivers since being first recorded in Devon in 1888, particularly the Teign and the Dart, and Japanese Knotweed *Fallopia japonica*. Hemlock Water-dropwort *Oenanthe crocata* also commonly clogs streams and ditches and cattle are regularly poisoned by its roots where it has been dug out. However, ferns in particular thrive in the moist air and *Hymenophyllum tunbridgense* and *Oreopteris limbosperma* are quite common. Cornish Moneywort *Sibthorpia europaea* can be found in some areas, particularly in the south and west of Dartmoor. Aquatic plants include Round-leaved Crowfoot *Ranunculus omiophyllum*, Bog Pondweed *Potamogeton polygonifolius*, Alternate Water-milfoil *Myriophyllum alterniflorum* and Intermediate Water Starwort *Callitriche brutia* subsp. *hamulata*.

Dartmoor's reservoirs supply industry, residents and holidaymakers with water and the plants growing in and around them have to cope with widely fluctuating water levels. The grass-like Shoreweed *Littorella uniflora* carpets the draw-down zone in many reservoirs and Spring Quillwort *Isoetes echinospora* is present in some reservoirs and ponds created from old clay workings in the southwest part of the Park, where Marsh Clubmoss *Lycopodiella inundata* is also present.

Of course this diversity of habitats does not occur in isolation, and one of the joys of Dartmoor is that the whole landscape is linked into one great ecosystem of which the human population is a part. In recent years there has been a growing awareness of the importance of taking a landscape scale approach to conserving and enhancing wildlife and habitats, and the 'ecosystem services' they provide. Many farmers on Dartmoor are now supported in their environmentally friendly farming by agri-environment schemes, and a number of organisations, including the National Park Authority, provide advice and promote the sharing of best practice. Increasingly, Dartmoor's wildlife is seen as an asset to economic development and there is a growing market for wildlife tourism and local products that are linked to the wildlife and special qualities of Dartmoor.

Areas of outstanding botanical interest

This landscape approach is particularly important when wildlife is facing challenges such as climate change. Plant species on Dartmoor are often at the edge of their range and have poor dispersal mechanisms. They are highly susceptible to fragmentation and degradation of their habitats. New initiatives are now restoring habitats (blanket bog, haymeadows and Rhôs pasture particularly), and knowledge is being shared as never before. Recent trends for key species are fairly stable, and although the distribution of Dartmoor's plants is bound to change, the future is bright.

Suzanne Goodfellow